



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/759,524	01/16/2001	Bausan Yuan	07303.0031	2126

22852 7590 12/11/2003

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER
LLP
1300 I STREET, NW
WASHINGTON, DC 20005

EXAMINER

KIM, PETER B

ART UNIT PAPER NUMBER

2851

DATE MAILED: 12/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/759,524

Applicant(s)

YUAN ET AL.

Examiner

Peter B. Kim

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-29,31-48,50-52 and 76-81 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 80 and 81 is/are allowed.
- 6) ☒ Claim(s) 17-21,23-29,31-40,42-48,50-52 and 76-79 is/are rejected.
- 7) ☒ Claim(s) 22 and 41 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 112003. 6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on Nov. 4, 2003 has been entered.

Applicant's arguments filed on Nov. 4, 2003 have been fully considered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 17, 18, 20, 21, 27-29, 31-37, 39, 40, 46-48, and 50-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sperling et al. (Sperling) (5,815,246) in view of Korenaga et al. (Korenaga) (6,414,742).

Sperling discloses in Fig. 1, 2 and 3, a stage assembly for manufacturing semiconductor wafers, comprising: a stage (5) to position a substrate, the stage being moved by a first member (51, 53, 59) of a force generator (45, 47, 49) in response to a wafer manufacturing control system (col. 12, lines 1-34); a base (43), having an upper side (Fig. 1), supporting the stage movable in response to a reaction force generated by a second member of the force generator (57, 55, 61), at least one pneumatic bearing (71) to support the base to movable along a first and a second axis

Art Unit: 2851

and rotatable around a third axis, where the axis are orthogonal to each other (col. 10, lines 4-31) relative to a stationary surface (69), and at least one actuator (73, 75, 77) to control movement of the base, the movement being caused by at least one of a disturbance force and a reaction force (col. 11, line 30-col. 12, line 34). Sperling also discloses moving the stage and the base in the opposite direction and traveling in inversely proportionate distances corresponding to a stage mass and a base mass (col. 11, line 30-col. 12, line 34). Sperling discloses the base has at least one degree of freedom, and the at least one actuator is capable of constraining the movement of base in at least one degree of freedom and generating correction forces in different direction and torque (col. 10, line 32-col. 12, line 34). Sperling discloses a first and second actuators generating correction force in different directions passing through a center of gravity of base and a third actuator generating a correction torque around a direction different from the first and second direction. (col. 11, line 30-col. 12, line 34). Sperling discloses a projection lens assembly (25) comprising the stage assembly, an object on which an image has been formed by the lens assembly and a lithography system comprising the projection lens assembly (Fig. 1). However Sperling does not disclose actuator for generating the correction torque located on the side outer surface of the base. Korenaga discloses in Fig. 1 and 5 and col. 5, line 43 – col. 6, line 51, an actuator (4) located on the side outer surface of the base (2) and generating correction torque about an axis perpendicular to the upper side of the base (4x, 4y, col. 6, lines 1-26). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide the actuator of Korenaga to the side of the base in Sperling because as taught by Korenaga, in col. 2, lines 18-41, to prevent transfer of reaction force to the floor.

Claims 19 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sperling et al. (Sperling) in view of Korenaga et al. as applied to claims 17 and 36 above, and further in view of Sasada (4,750,721).

Sperling discloses the claimed invention as discussed above. However, Sperling does not explicitly disclose that a combined center of gravity of the stage and the base remains stationary. Sasada discloses a movable table system in Fig. 3, with the stage and the base moving in opposite direction and traveling inversely proportionate distances corresponding to a stage mass and a base mass (col. 3, line 54-col. 5, line 40). Sasada also discloses that the center of gravity of the system remains stationary (col. 8, lines 56-62). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide the table system of Sasada where the center of gravity of the system remains stationary to the invention of Sperling in order to prevent vibration of the reaction force from detrimentally affecting the system of Sperling.

Claims 23-26, 42-45 and 76-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sperling et al. (Sperling) in view of Korenaga et al. as applied to claims 17 and 36 above, and further in view of Tokuda et al. (Tokuda) (2002/0054280).

Sperling discloses the claimed invention as discussed above. However, Sperling does not disclose the actuators with a damper. Sperling also does not disclose a sensor to detect an actual position of the base. Sperling also does not disclose the actuator with a first unit connected to the base and a second unit connected to the stationary surface where the second unit is connected to the first unit magnetically. Tokuda discloses a stage assembly with a sensor (40) for detecting the acceleration of the base (33), and based on the change of the position of the base, correction

Art Unit: 2851

force is generated (para. 0107-0109). Tokuda also discloses in Fig. 2, an actuator that moves the counter mass (39, 38) based on the reaction force from the movement of the base (33). The actuator comprises of linear motor (para. 0090-0092) with a damper (Fig. 2). The actuator of Tokuda includes a first unit connected to the base and a second unit connected to stationary member (Fig. 2). Tokuda also discloses using magnetic field and Lorentz force to drive the actuator (para. 0092). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide the acceleration sensor and the actuators of Tokuda to the invention of Sperling in order to efficiently correct the reactive force affecting the movement of the base.

Allowable Subject Matter

Claims 80 and 81 are allowed.

Claims 22 and 41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

None of the prior art of reference teaches or discloses a stage assembly with a pneumatic bearing that supports the base with a first layer of pressurized air to move the base and a second layer of pressurized air to allow a top flat surface of the bearings to conform to an undersurface of the base.

Remarks

Applicant argues that actuators (4x and 4y) of Korenaga do not generate a correction torque about an axis perpendicular to the reference plane of the base; however, according to col.

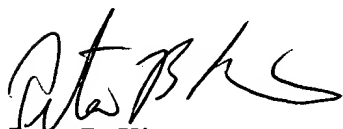
Art Unit: 2851

5, line 62 – col. 6, line 60 of Korenaga, does teach generating a correction torque about an axis perpendicular to the reference plane of the base.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Kim whose telephone number is (703) 305-0105. The examiner can normally be reached on Monday-Thursday from 6:30 AM to 4:00 PM. The examiner can also be reached on alternate Fridays during the same hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams, can be reached on (703) 308-2847. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.



Peter B. Kim
Patent Examiner
November 29, 2003